

REMARKS

Claims 1-20 are all the claims presently pending in the application. The Examiner has withdrawn claims 8, 10, and 12 from consideration. Applicant has amended claims 1-5, 9, 12, and 13 to define the claimed invention more particularly. Applicant has added new claims 14-20 to claim additional features of the invention and to vary the protection for the claimed invention further.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-7, 11, and 13 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Claim 2 stands rejected under 35 U.S.C. § 112, fourth paragraph, as allegedly being of improper dependent form. Claim 3 stands rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Claims 1-3, 7, and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spainhour (U.S. Patent No. 4,317,667) in view of Tsuchiya (U.S. Patent No. 5,114,338). Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spainhour in view of Tsuchiya and further in view of Andrejco (U.S. Patent No. 4,474,593). Claims 6 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spainhour in view of Tsuchiya and further in view of Sayce (U.S. Patent No. 5,735,928). Claims 9 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spainhour in view of Tsuchiya and further in view of Suda (U.S. Patent No. 4,618,354).

Applicant respectfully traverses these rejections in the following discussion.

I. THE CLAIMED INVENTION

An exemplary aspect of the claimed invention (e.g., as recited in claim 1) is directed to a method of manufacturing porous glass base material for optical fiber.

The method includes flame-hydrolyzing raw materials in an oxyhydrogen flame to generate glass fine particles, depositing the glass fine particles on a rotating target to form the porous glass base material by using a burner, moving the burner relative to the rotating target such that there is a moving area, on a surface of the rotating target, where the glass fine particles are carried in flame to directly hit the rotating target, and cooling a surface of the porous glass base material, during the depositing, while adjusting a temperature difference (Ta-Tb) between a surface temperature of the moving area (Ta) and a surface temperature of an area of the porous glass base material outside the moving area (Tb) to be within a range from 200 °C to 700 °C.

The porous glass base materials made by conventional methods were found to have significant drawbacks. For improving the deposition efficiency, an excessive cooling makes a large surface temperature difference between the outer layer and the inner layer in the porous glass base materials. This causes a difference between the contraction ratio of the outer layer and the inner layer, which may cause cracks to form on the surface of the glass base material. (Application at page 3, lines 19-25).

The claimed invention, as defined by exemplary claim 1, includes cooling a surface of the porous glass base material, during the depositing, while adjusting a temperature difference (Ta-Tb) between a surface temperature of the moving area (Ta) and a surface temperature of an area of the porous glass base material outside the moving area (Tb) to be within a range from 200 °C to 700 °C (e.g., see Application at page 3, lines 26-30). This exemplary feature may provide a

method of manufacturing porous glass base material for optical fiber in which cracking of the surface of the porous glass base material is prevented and a glass particle deposition rate is improved (e.g., see Application at page 5, lines 3-4).

II. THE 35 U.S.C. § 112, SECOND PARAGRAPH, REJECTION

The Examiner alleges that the claimed invention of claims 1-7, 11, and 13 is indefinite. Specifically, the Examiner alleges that the last two lines of claim 1 contradict the preamble.

Applicant has amended claim 1 to clarify the claimed invention. Specifically, Applicant has removed, from the last two lines of claim 1, the step of “dehydrating and sintering.” Accordingly, claim 1 is believed to no longer include a contradiction.

Applicant has included the above feature of “dehydrating and sintering” in new claim 14, which is drawn to a “method of manufacturing glass base material for optical fiber.” Applicant believes that new claim 14 is clear and non-contradictory with respect to the “dehydrating and sintering” step.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

III. THE 35 U.S.C. § 112, FOURTH PARAGRAPH, REJECTION

Claim 2 stands rejected under 35 U.S.C. § 112, fourth paragraph, as allegedly being of improper form.

As amended, claim 2 is drawn to a “porous glass base material for optical fiber made according to the method of claim 1.” Applicant submits that the amended claim is in proper product-by-process form.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

IV. THE 35 U.S.C. § 112, FIRST PARAGRAPH, REJECTION

The Examiner alleges that claim 3 stands as allegedly failing to comply with the written description requirement.

As amended, claim 3 recites, *inter alia*, “said moving area is displaced as said burner moves.” Applicant submits that the specification provides adequate teaching so as to reasonably convey to one skilled in the relevant art that the inventor, at the time the Application was filed, had possession of the claimed invention. For example, the originally filed Application provides support for amended claim 3 at least in the third line from the bottom on page 4.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

V. THE PRIOR ART REJECTIONS

A. THE ALLEGED COMBINATION OF SPAINHOUR AND TSUCHIYA

The Examiner alleges that one of ordinary skill in the art would have combined Spainhour with Tsuchiya to render obvious the claimed invention of claims 1-3, 7, and 9. Applicant respectfully submits, however, that, even if combined, the alleged combinations of references would not teach or suggest each and every feature of the claimed invention.

That is, the alleged combinations of references does not teach or suggest, “*cooling a surface of the porous glass base material, during said depositing, while adjusting a temperature difference ($T_a - T_b$) between a surface temperature of said moving area (T_a) and a surface*

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temperature of an area of said porous glass base material outside said moving area (Tb) to be within a range from 200 °C to 700 °C,” as recited in exemplary claim 1.

None of the cited references discloses the claimed range of “200 °C to 700 °C.”

Regarding this feature, the Examiner argues first that the claim does not require cooling if there is no touching, and second, that the range of 200 °C to 700 °C only pertains to when there is touching. Applicant has amended claim 1 to clearly recite “cooling a surface of the porous glass base material, during said depositing, while adjusting a temperature difference (Ta-Tb) ... to be within a range from 200 °C to 700 °C,” with the temperature difference (Ta-Tb) defined as the temperature difference “between a surface temperature of said moving area (Ta) and a surface temperature of an area of said porous glass base material outside said moving area (Tb).” The “moving area” refers to an “area, on a surface of the rotating target, where the glass fine particles are carried in flame to directly hit the rotating target.” Amended claim 1 positively recites the “cooling” step the range of 200 °C to 700 °C.

Thus, even assuming, *arguendo*, that Spainhour discloses “cooling” in the sense of the claimed invention, Spainhour is completely silent with respect to the claimed range of “200 °C to 700 °C.” Applicant further submits that Spainhour fails to teach, suggest, or otherwise render obvious the combination of features recited in claim 1 including the claimed range of “200 °C to 700 °C,” even considered together with the disclosure of Tsuchiya.

Therefore, even if combined, the alleged combinations of references would not teach or suggest each and every feature of the claimed invention. Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

B. THE SECONDARY REFERENCES

The Examiner alleges that one of ordinary skill in the art would have combined Spainhour with Tsuchiya and Andrejco to teach the claimed invention of claims 4 and 5. Furthermore, the Examiner alleges that one of ordinary skill in the art would have combined Spainhour with Tsuchiya and Sayce to teach the claimed invention of claims 6 and 11. Furthermore, the Examiner alleges that one of ordinary skill in the art would have combined Spainhour with Tsuchiya and Suda to teach the claimed invention of claims 9 and 13.

Applicant respectfully submits, however, that claims 4-6, 9, 11, and 13 are allowable at least based on analogous reasons to those set forth above, in section A, with respect to claims 1-3, 7, and 9.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw these rejections.

VI. NEW CLAIMS

Applicant has added new claims 14-20 to claim additional features of the invention and to vary the protection for the claimed invention further. The originally filed application provides support for the features recited in new claims 14-20 at least in pages 5-6 of the originally filed specification. New claims 14-20 are allowable based on the novel and non-obvious features recited therein.

Applicant submits that new claims 14-20 are allowable at least based on analogous reasons to those set forth above with respect to claims 1-13.

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VII. FORMAL MATTERS AND CONCLUSION

As explained above with respect to the rejection under 35 U.S.C. § 112, first paragraph, the amended claim 3 is adequately supported in the specification. Accordingly, Applicant respectfully requests the Examiner to withdraw the objection to the specification.

In view of the foregoing, Applicant submits that claims 1-20, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. Applicant respectfully requests the Examiner to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, Applicant requests the Examiner to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The undersigned hereby authorizes the Commissioner to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

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Respectfully Submitted,



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